REMARKS

Applicants appreciate the Examiner's thorough examination of the subject application and request reconsideration of the subject application based on the foregoing amendments and the following remarks.

Claims 20-29, 31-41, 48-50, 58 and 59 are pending in the subject application.

Claims 20-29, 31-41, 48-50, 58 and 59 stand rejected under 35 U.S.C. §103.

Claims 1-12, 14-19, 55-57 and 60, which were previously withdrawn from consideration as the result of an Examiner's restriction requirement, also were previously canceled. In view of the foregoing, Applicants reserve the right to present the above-identified canceled, withdrawn claims in a divisional application.

Claims 20, 21, 23, 26 and 27 were amended for clarity and to more distinctly claim Applicant's invention. Specifically, the claims were amended to more clearly indicate that the illuminating mechanism is spaced from the surface at the treatment site being illuminated by the radiation/ light from the illuminating mechanism.

The amendments to the claims are supported by the originally filed disclosure.

35 U.S.C. §103 REJECTIONS

Claims 20-29, 31-41, 48-50, 58 and 59 stand rejected under 35 U.S.C. §103 as being unpatentable over the cited prior art for the reasons provided on pages 2-3 of the above-referenced Office Action. Because claims were amended in the foregoing amendment, the

following discussion refers to the language of the amended claim(s). However, only those amended features specifically relied on in the following discussion shall be considered as being made to overcome the prior art reference. The following addresses the specific rejections provided in the above-referenced Office Action.

CLAIMS 20, 21, 24- 29, 31, 32, 37-41, 48-50, 58 & 59

Claims 20, 21, 24-29, 31, 32, 37-41, 48-50, 58 and 59 stand rejected as being unpatentable over Motamedi et al. [USP 6,143,019; "Motamedi"] in view of Magada et al. [USP 5,567,687; "Magada"] for the reasons provided on page 2 of the above referenced Office Action. Applicants respectfully traverse.

As grounds for the rejection, the Office Action provides that Motamedi teaches a photodynamic therapy to treat cardiac arrhythmias and that Magada teaches the use of MRI to locate and determine the efficacy of photodynamic therapy.

Applicants claim, claim 20, a non-thermal method for treating and/or curing cardiac arrhythmias including the steps of administering a photosensitizing agent to a desired treatment site and utilizing a device according to any one of a first through seventh device to destroy tissues and pathways from which abnormal signals arise and/or in other cardiac tissues by photochemotherapy or photodynamic therapy using the administered photosensitizing agent, such that abnormal electrical rhythms cannot be generated and/or sustained. In addition, such a method includes using MR imaging to *guide the device* and *assist in monitoring* the progress of the photochemotherapy or photodynamic *therapy*.

Each of the first through seventh devices of claim 1 includes *inter alia* an illumination mechanism and an MRI receiver. Also said step of utilizing includes positioning any one of the first through seventh devices so the illumination mechanism thereof is spaced from the surface of the treatment site such that radiation emitted by the illuminating mechanism impinges upon the surface.

The primary reference, Motamedi is asserted as teaching treatment using a photodynamic therapy to treat cardiac arrhythmias. While it is correct that Motamdei is replet with refernces to photodynamic therapy as a mechaism for treating cardiac arrhythmias, of more particular note, is that Motamedi does not anywhere specifically describe how the device or invention disclosed therein is to be used in such photodynamic therapy thecnique.

Except for the reference to photodynamic therapy as being a form of ablation in Motamedi, the only discussion in Motamedi regarding such a technique is found in the discussion for Example 7 (see col. 14, lines 30-42). This discussion, merely provides that the devices of the invention in Motamedi can also be used for techniques or methods that can be considered a form of non-lethal arrhythmia ablation. Other than this, there is no details as to the manner in which this therapy is carried out.

Specifically, there are a number of references in Motamedi, such as that in conneciton with Figure 2 thereof, which specifcally indicates that tip 42 of the described catheter 22 is extended past the catheter sheath a predetermined distance so as to puncture the endocardium and to extned into the tissue. In this way, it is further described that this corresponds to the

irrradiating position and that in this position the radiation ios delivered to the tissue and thgus avoids irradiating the endocardial surface and the blood pool. Whether one could conclude that the referecne was teaching that the tip 42 is being inserted into the tissues when this technique is to be carried out, it is clear that the reference only teaches inserting the tip into the tisssue.

In the present invention, the third devcice described in claim 20 provides that the ligth capable of activating the photosensitizing agent is deliver through the ballon. It is clear from the discussion in Motamedi, and as provided above, that the tip extend from the cathere sheath and the stablizing device 40, which can comprise a ballon is located remote from the tip when it is inserted into the tissues. As such, it is not physically possible for the ligth from the tip to pass through the stabilizing device. It also necessarily follows that in the third device, the photosensitizing agent cannot be perfused into the ballon and delivered by the ballon to the treatment site as the ballon clearly also must be remote from the treatment site as well.

As previously indicated by Applicants, it is important to accurately position the catheter within the cardiac chambers (*e.g.* to position the probe in the pulmonary vein orifices). Guidance in accurately placing the catheter can be based upon local anatomical landmarks and, thus, MR cardiac imaging will be particularly beneficial. Further, because the procedure takes place in the left atrium, the risk of generating emboli is of particular concern. Use of local MR imaging will allow the surgeon to watch for any coagulation on the endocardial surface. Still further, MR imaging can be used to titrate and direct therapy delivery. For example, MR imaging can be used to monitor oxygenation levels, which is particularly important in photodynamic therapy because photodynamic therapy causes increased oxygen consumption. Using MR imaging, tissue oxygen

saturation can be imaged (the change from diamagnetic oxyhemoglobin to paramagnetic deoxyhemoglobin results in decreased signal intensity). This can be used to determine which tissue is affected and also to control light intensity to ensure that tissue does not become so hypoxic as to reduce free radical generation.

As also previously indicated by Applicants, MR imaging can be used to monitor phosphate levels, which is particularly important in photodynamic therapy because with photodynamic therapy, induced cellular damage, especially mitochondrial damage, rapid deterioration of ATP concentration is expected. If the mitochondrial membrane is compromised, cells have little ability to compensate for this change. Thus, MR imaging can be an excellent marker of overall cellular metabolic state and eventual response to photochemotherapy or photodynamic therapy. MR imaging can further be used to perform sodium imaging, wherein a change in sodium signal strength, which is proportional to cellular depolarization/damage, will be observed.

In contrast to the present invention, Magada (see Example 14 discussion) makes no reference to guiding the laser light emitting device by mean of MRI. Magada also nowhere describes that the laser emitting device also is configured so it includes the MRI receiver that detects MRI signals for MRI imaging for guiding as well as assessing *in vivo* the performance of the therapy .

Moreover, the descrined use of the MRI process in Magada involves postmortem analysis of tissue sample or to ascertain the accumulation of plaque in the wall of the aorta prior to the method being carried out. Post mortem analysis hardly is the same as *in vivo* monitoring the

progress of the therapy. As such, the assertion that Magada teaches MRI imaging to guide the device and to assist in monitoring the progrss of photochemotherapy or photodynamic therapy would appear to be an overstatement off what is disclosed and taught in Magada.

Notwithstanding the foregoing and in the interests of advancing prosecution, Applicants have amended claim 20 so as to provide that the illumination mechanism is spaced from the surface of the treatment site so that the radiation/ light from the illuminating mechanism impinges upon the surface of the treatment site. As indicated herein, this clearly is not taught, suggested nor described anywhere in Motamedi. It also is respectfully submitted that if the device and method disclosed in Motamedi were modified so as to conform to the methodlogy claimed by Applicants, the resultant methodlogy would necessarily destroy the intended purpose and function of the device and method disclosed in the primary reference.

It is respectfully submitted that claims 20, 21, 24-29, 31, 32, 37-41, 48-50, 58 and 59 are patentable over the cited reference(s) for the foregoing reasons.

CLAIMS 22-23

Claims 22 and 23 stand rejected as being unpatentable over Motamedi et al. [USP 6,143,019; "Motamedi"] in view of Magada et al. [USP 5,567,687; "Magada"] as applied to claim 21 and further in view of Altman [USP 6,577,895] for the reasons provided on page 2 of the above referenced Office Action. Applicants respectfully traverse.

As indicated in the discussion above concerning claim 20, the combination of Motamedi and Magada does not disclose a methodology embodying the MRI and illumination techniques of

the present invention. Thus, and at least for the reasons articulated above in connection with claim 21, it is submitted that claims 22 and 23 are considered to be allowable.

Also, Altman apparently is being used for the limited purposes of allegedly teaching ablating the pulmonary vein to treat cardiac arrhythmias. As such, the foregoing reasons articulated for claim 21, also apply to distinguish claims 22 and 23 from the combination of Motamedi, Magada and Altman.

It is respectfully submitted that claims 22 and 23 are patentable over the cited reference(s) for the foregoing reasons.

CLAIMS 33-36

Claims 33-36 stand rejected as being unpatentable over Motamedi et al. [USP 6,143,019; "Motamedi"] in view of Magada et al. [USP 5,567,687; "Magada"] as applied to claims 20, 21, 24-29, 31, 32, 37-41, 48-50, 58 and 59 and further in view of Leone [USP 5,709,653] for the reasons provided on page 3 of the above referenced Office Action. Applicants respectfully traverse.

As indicated in the discussion above concerning claims 20-21, 24-29, 31, 32, 37-41, 48-50, 58 and 59, the combination of Motamedi and Magada does not disclose a methodology embodying the MRI and illumination techniques of the present invention. Thus, and at least for the reasons articulated above in connection with claims 20-21, 24-29, 31, 32, 37-41, 48-50, 58 and 59, it is submitted that claims 33-36 are considered to be allowable.

Also, Leone apparently is being used for the limited purposes of allegedly teaching a porous balloon for delivering a photodynamic therapy substance. As such, the foregoing reasons articulated for claims 20-21, 24-29, 31, 32, 37-41, 48-50, 58 and 59, also apply to distinguish claims 33- 36 from the combination of Motamedi, Magada and Leone.

As also noted herein, in Motamedi the tip extends from the catheter sheath and the stabilizing device (the balloons) is arranged on the catheter so that it is remote from the tissues in which the tip is being inserted. As such, no one skilled in the art, would have contemplated the use of a porous balloon to deliver the photosensitizing agent to the desired treatment area as the stabilizing device (balloon) as taught in Motamedi is away from the treatment site.

It is respectfully submitted that claims 33-36 are patentable over the cited reference(s) for the foregoing reasons.

The following additional remarks shall apply to each of the above.

As provided in MPEP 2143.01, obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. *In re Fine*, 837 F. 2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988); *In re Jones*, 958 F. 2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). As provided above, the references cited, alone or in combination, include no such teaching, suggestion or motivation.

Furthermore, and as provided in MPEP 2143.02, a prior art reference can be combined or

modified to reject claims as obvious as long as there is a reasonable expectation of success. *In re Merck & Co., Inc.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 19866). Additionally, it also has been held that if the proposed modification or combination would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims *prima facie* obvious. Further, and as provided in MPEP-2143, the teaching or suggestion to make the claimed combination and the reasonable suggestion of success must both be found in the prior art, not in applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991). As can be seen from the forgoing discussion regarding the disclosures of the cited references, there is no reasonable expectation of success provided in the reference(s). Also, it is clear from the foregoing discussion that the modification suggested by the Examiner would change the principle of operation of the device disclosed in the primary reference.

As provided by the Federal circuit, a 35 U.S.C. §103 rejection based upon a modification of a reference that destroys the intent, purpose or function of the invention disclosed in a reference, is not proper and the prima facie case of obviousness cannot be properly made. In short there would be no technological motivation for engaging in the modification or change. To the contrary, there would be a disincentive. *In re Gordon*, 733 F. 2d 900, 221 USPQ 1125 (Fed. Cir. 1984). In the present case it is clear that if the cited reference was modified in the manner suggested by the Examiner it would destroy the intent, purpose or function of the device as taught by the primary reference.

It is respectfully submitted that for the foregoing reasons, claims 20-29, 31-41, 48-50, 58 and 59 are patentable over the cited reference(s) and satisfy the requirements of 35 U.S.C. §103. As such, these claims are allowable.

OTHER MATTERS

Applicants filed a Supplemental Information Disclosure Statement/ Search Report Information Disclosure Statement dated September 3, 2004, which IDS post-dates the above-referenced Office Action. Accordingly, Applicants respectfully request that the Examiner reflect their consideration of this IDS in the next official communication from the USPTO. Applicants also respectfully request the Examiner to call the undersigned collect and the below number in the event that this IDS has not been received by the Examiner and thus needs to be again submitted by Applicants for the Examiner's consideration.

It is respectfully submitted that the subject application is in a condition for allowance. Early and favorable action is requested.

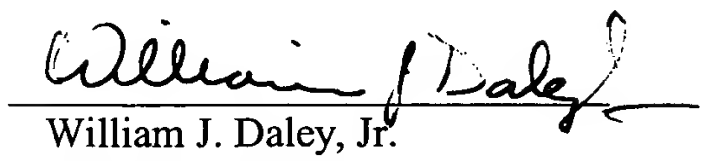
Applicants believe that additional fees are not required for consideration of the within Response. However, if for any reason a fee is required, a fee paid is inadequate or credit is owed

for any excess fee paid, the Commissioner is hereby authorized and requested to charge Deposit

Account No. **04-1105**.

Respectfully submitted,
Edwards & Angell, LLP

Date: February 24, 2005

By: 

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